

HR-242 The Economics of Reducing the County Road System, Three Case Studies in Iowa

Key Words: Rural highways, highway abandonment, benefit-cost, property access, farm travel, gravel roads, unpaved roads, maintenance, low volume roads, investment analysis

ABSTRACT

Many of today's local rural roads and bridges were built in the late 1800s and early 1900s when farms were small, and farmers needed road access to homes, schools, churches, and markets. During the 1920s and 1930s, these roads were surfaced, mainly with gravel, and bridges were reinforced to carry six-ton loads. Since then, farm size has increased and the number of heavy vehicles traveling on rural roads has also increased, to the detriment of the road system. Farmers are using large tandem-axle and semi-trailer trucks, long farm tractor-wagon combinations, and wide combines to travel from farms to fields and vice versa. Farm supply and marketing firms are using similar heavy trucks for pickups and deliveries. At the same time, revenues to maintain the present system and to reconstruct it to accommodate the changing needs of rural America are declining in real terms. Unless revenues increase or the investment needs decline, the local rural road system will continue to deteriorate.

A benefit-cost analysis was used to examine the effects of alternative investment strategies on the local rural road system. The study first estimated the change in costs to the traveling public of various investment strategies. The change in travel cost of each investment strategy was then compared to the cost of implementing that strategy on the county rural road system. The basic purpose of this study was to develop guidelines for local supervisors and engineers in evaluating investment or disinvestment proposals, and to provide information to state legislatures in developing local rural road and bridge policies.

For this analysis, three case study areas of 100 square miles each were selected in Iowa. One study area, located in Hamilton County, has a relatively high agricultural tax base, a high percentage of paved roads, and relatively few bridges. The second study area, located in Shelby County, has a relatively low agricultural tax base, hilly terrain, a low percentage of paved roads, a large number of soil and earth-surface roads, and many bridges. The third study area, located in Linn County, has a relatively high agricultural tax base, a high percent-age of paved roads, and numerous non-farm households with commuters to Cedar Rapids and Waterloo.

A questionnaire was used to collect data from farm and non-farm residents in the three study areas. Data were obtained on the number of 1982 trips by origin, destination, and type of vehicle.

Several investment strategies were analyzed in this study:

1. Reducing the size of the county road system by abandoning sets of low volume roads that serve no property accesses
2. Reducing the number of miles of public roads by converting continuous roads to private drives
3. Paving selected gravel roads and then abandoning low volume roads that serve no property accesses
4. Converting selected low volume roads that serve no households or farmsteads to low maintenance roads
5. Reducing the number of miles of public roads by converting sets of dead-end roads to private drives
6. Converting all existing paved roads to gravel roads
7. Upgrading selected bridges to legal load limits

Conclusions from the research are as follows;

- The major sources of vehicle miles on county roads are automobiles used for household purposes and pickup truck travel for farm purposes.
- Farm-related travel represents a relatively small percentage of total travel miles but a relatively high percentage of total travel costs.
- A relatively small number of low volume abandoned roads produced greater cost savings to the counties and abutting landowners than the additional travel costs to the traveling public.

The sets of roads abandoned in this study that resulted in positive net savings were:

1.
Almost four percent of the non-paved county roads in the Linn study; however, the net savings were very small. This area had a large number of non-farm households on the county roads.
2.
Slightly, over 5 percent of the non-paved county roads in the Shelby study. This area had a very small number of paved county roads.
3.
Over 12 percent of the non-paved county roads in the Hamilton study. This area had a relatively large number of paved county and state roads.

- Paving additional county roads increased the net savings from the abandonment of low volume, no-property-access roads. However, the net costs of paving these roads exceeded the gain in net savings from abandonment.
- Converting low volume roads to low maintenance area service B roads produced the largest net savings of all strategies evaluated in this study. However, bridge deterioration and county liability on area service B roads are potential problems.
- Converting low volume roads to private drives also produced positive net savings. Dead-end roads produced greater net savings than non-dead-end roads. However, this strategy shifts part of the public maintenance burden to abutting landowners.
- Reconstructing selected bridges to legal load limits reduced large truck and tractor-wagon travel costs. However, the additional bridge reconstruction costs exceeded the reduction in travel costs.
- The benefits in reduced travel costs from the existing paved county roads in the Hamilton study area substantially exceeded the costs of providing those county roads.